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part of the spectrum, yet the general appearance of the photographic spectrum on a plate dyed with pinachrom approximates more to the visual spectrum, than photographs taken on isochromatic or ordinary plates. The hydrogen bright lines H_γ and H_δ were well seen on Dec. 6. Assuming that the increased brilliancy of the star at maximum is due to temperature, it is important to notice that the extension of the spectrum into the violet is also accompanied by a much greater radiative power in the red and orange part of the spectrum.

Stonyhurst College Observatory:
1907 *June* 6.

Note on the Colours of α *and* o (*Mira*) *Ceti.*

By W. S. Franks.

In the paper communicated by the Radcliffe observer on the magnitude of o (*Mira*) Ceti [*Monthly Notices*, April 1907, p. 412] there are some remarks on its colour, as compared with α Ceti and other stars. Perhaps some of my recorded observations of these objects may be of interest, as they cover a period from 1876 to 1893. Briefly they are as follows:—

o Ceti orange-red, 26 Nov. 1876, 5-inch o.g.
,, splendid yellow, 28 Nov. 1877, ,, (near *maximum*).
,, bright yellow, 22 Oct. 1878 ,,
,, decidedly red, 14 Dec. 1884, $11\frac{1}{4}$ in spec. (about 8^m).
,, orange-yellow, 21 Jan. 1885, ,, (,, $3\frac{1}{2}^m$).
,, OrR^3 (orange-red), 17 Sept. 1887, $8\frac{1}{2}$ in spec. (est. $7^m \pm$).
,, OrR^2 (pale or. red), 24 Sept. 1887, ,, (invis. to n. eye).
,, Or^3 (orange), 4 Oct. 1887, ,, (about 6^m).
,, too small for colour, 1892, 3-inch o.g.
,, Y^3 to OrR^3 (10 obs.), 1893, B.A.A. Coloured Star Section.
α Ceti bright orange, 28 Nov. 1877, 5-inch o.g.
,, pale orange, 14 Dec. 1884, $11\frac{1}{4}$ in. spec.
,, Or^2 (pale orange), 24 Sept. 1887, $8\frac{1}{2}$ in. spec.
,, Or^3 (orange), 17 Sept. 1887, $8\frac{1}{2}$ in. spec.
,, Or^3 (orange), 4 Oct. 1887, ,,
,, Or^2 (pale orange), (5 obs.) 1892, 3-inch o.g.
,, OrY^2 (pale or. yel.), (mean of 33 obs.), 1893, B.A.A. Coloured Star Section.

The colour symbols are those of the nomenclature proposed in vol. xlvii. p. 269 of *Monthly Notices*, which has been found convenient in practice, as by its aid over 36,000 observations have been made, by various persons, of the colours of all the brighter stars in both the Northern and Southern hemispheres, and mean results deduced.

There is no doubt but that *Mira* does exhibit fluctuations in its colour, as evidenced by many observers, but this is probably only an accompaniment of its variation in brightness.

Uxbridge: 1907 *May* 17.

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The Relation between Star Colours and Spectra. By W. S. Franks.

During an enforced leisure, I have made some investigations into the connection between the colours of stars and their spectra (see *The System of the Stars*, by Miss Clerke, p. 149), which may possibly be of interest to the Fellows of this Society. The material was gathered from the following sources. For *colours* of the brighter stars, I used the mean values of the observations made by members of the B.A.A. in 1890–3, and published in vol. i. part 3 and vol. ii. part 4 of the *Memoirs* of that Association,—the 928 stars selected depending on about 30,000 observations; they extend from the N. Pole to 25° south declination. For *southern* stars, between – 25° and the S. Pole, I made use of the observations by the New South Wales star colour section, published in B.A.A. *Journal*, vol. vi. p. 416 and vol. viii. p. 17. The number of southern stars selected was 432, resting on nearly 5000 observations; the aggregate is therefore 1360 of the brighter stars in both hemispheres. The same colour symbols were used throughout—they are published in the *Monthly Notices*, vol. xlvii. p. 269. The spectra were derived from vol. xxviii. part 2 of the *Harvard Annals* for the southern objects; and for the remainder, from *H.A.*, vol. xlviii. part 4 (catalogue of 1520 bright stars).

At the commencement I made a careful analysis of the colours and spectra of the southern stars, entering all in tabulated form under the 24 headings into which the spectra were divided—a condensed summary of which is seen in Table I. The same was done for the northern stars, as shown in Table II. Table III. is a list of the most obvious *discordances*, which amount to about 2½ per cent. of the whole. Table IV. gives the results of Tables I. and II. combined, and is probably the most trustworthy for generalisation.

Table I.

Summary of Analysis of 432 *Southern Stars from* – 25° *to S. Pole.*

Group.	Division.	Spectra.	Type.	O	YG^1	Y^1	OrY^1	Y^2	OrY^2	Or^2	Y^3	OrY^3	Or^3	OrR^3	R^3	Stars
1	I*a*.	Oa to B9A	Helium stars	46	50	43	6	6	2	...	...	...	...	...	...	153
2	I*b*.	A to A5F	Hydrogen stars	7	9	28	9	13	...	...	...	...	...	...	...	66
3	I.–II.	F to F5G	α Carinæ type	1	5	6	6	11	8	...	5	...	...	...	...	42
4	II.	F8G to G5K	Solar stars	...	3	2	5	7	11	...	5	3	2	...	...	38
5	II.–III*a*.	K	Arcturus type	...	...	1	5	4	31	6	6	8	6	...	...	67
6	II.–III*b*.	K2M and K5M	Aldebaran type	...	...	...	...	2	7	1	1	10	20	6	...	47
7	III.	Ma to Md	Betelgeuse type	...	...	...	1	1	3	...	...	2	9	1	2	19
			Total	54	67	80	32	44	62	7	17	23	37	7	2	432

Notes.—Three G^1 included with O; two YG^2 with YG^1; two OrR^2 with Or^2; two OrY^4 with OrY^3; six Or^4 with Or^3; two OrR^4 with OrR^3; and one spectrum Q (Peculiar), η Carinæ, in R^3.

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